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D E C I S I O N
of 31 March 1994

Case Number: T 1055/92 - 3.5.1

Application Number: 86200750.7

Publication Number: 0201130

IPC: G06F 15/62

Language of the proceedings: EN

Title of invention:

System for spatially transforming images

Applicant:

AMPEX CORPORATION

Opponent:

-

Headword:

Clarity/AMPEX CORPORATION

Relevant legal norms:

EPC Art. 76(1), 83, 84, 123(2)

Keyword:

"Clarity (yes)"

Decisions cited:

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Headnote:

- I. The form and content of the claims in a European patent application are governed by the requirements of Article 84 and Rule 29 EPC. According to Article 84, the

claims shall define the matter for which protection is sought.

.../...

This function of the claims should be clearly distinguished from the requirement that the European patent application must disclose the invention in such a way that it enables a person skilled in the art to carry out that same invention.

- II. Under Article 83, sufficient disclosure is required in a European patent application, i.e. in the application as a whole, comprising the claims, together with the description and the drawings, but not of an individual claim as such.
- III. A claim in a European patent application must comprise the essential features of the invention (cf. T 32/82, OJ EPO 1984, 354); the essential features should in particular comprise those features which distinguish the invention from the closest prior art.

Case Number: T 1055/92 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 31 March 1994

Appellant: AMPEX CORPORATION
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Decision under appeal: Decision of the Examining Division of the European Patent Office dated 29 September 1992 refusing European patent application No. 86 200 750.7 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. Randes
G. Davies

Summary of Facts and Submissions

I. Appellant's European patent application No. 86 200 750.7, filed on 1 May 1986, which is a divisional application of an earlier application (publication No. 0 076 259), filed on 10 April 1981, was refused by a decision of the Examining Division dated 29 September 1992.

II. The reason given for the refusal was that Claim 1 did not meet the requirements of Article 84 EPC.

In particular the Examining Division stated that the last paragraph of Claim 1 was vague and indefinite. It contained phrases which did not define the matter for which protection was sought in terms of technical features of the invention in a clear and concise manner, because it was not clear how the values of the command parameters for fields between successive knots were to be computed in terms of the values of the respective command parameters and their derivatives at the knots.

III. On 27 October 1992 the Appellant filed a notice of appeal against that decision, paying the appeal fee on the same day. The Statement of Grounds was filed on 2 November 1992, accompanied by a set of Claims 1 to 7.

The independent Claims 1 and 6 read as follows:

"1. A control system for an image transformation system (1300) which is operable to act on input arrays of data samples representing video fields to compute, for each of a multiplicity of fields in a sequence, a

modified array of data samples in accordance with the values in respect of that field of a plurality of command parameters which determine for each field a spatial transformation of an image represented by the respective input array of data samples, the control system comprising:

means (1422, 1424, 1308, 1310) for selecting the said multiplicity of fields in the sequence;

means (1428, 1308, 1310) for programming a plurality of knots, which are few in number relative to the multiplicity of fields in the sequence and which are represented by selected fields and which comprise an initial knot, a final knot and at least one intermediate knot;

means (1410, 1426, 1308, 1310) for setting values of selected command parameters for each of the knots; and

a controller (1314) which (1) stores the set values of the selected command parameters for each of the knots; and (2) computes values for each of the said command parameters for fields between successive knots (a) in accordance with the values of the respective command parameter at preceding and succeeding knots and (b) in accordance with the values of the slope or first derivative of the respective command parameter at the said preceding and succeeding knots, so that the spatial transformations provide a smooth and continuously changing video effect.

6. A method of controlling an image transformation system (1300) to produce a complex and continuously

varying video effect extending over a sequence composed of a multiplicity of video fields without sudden stepwise change, comprising the steps of:

selecting the image manipulation variables for the video effect and selecting the said multiplicity of fields in the sequence;

specifying knots corresponding to selected fields in the sequence, the knots including a first knot, a final knot and at least one intermediate knot;

storing for each of the knots a plurality of parameters which each specify, at each knot, the state of a respective image manipulation variable;

computing the said parameters for fields between knots in accordance with the values of the respective parameter at preceding and succeeding knots and in accordance with the values of the slope or first derivative of the parameter at the said preceding and succeeding knots, whereby to provide for each field in the sequence the said image manipulation variables; and

providing the thus computed image manipulation variables to the image transformation system as transformation commands."

Claim 1 is distinguished from refused Claim 1 only in that the expressions "in terms of" in the last paragraph of the claim (after (a) and (b) respectively) have been changed into "in accordance with". Claim 6 is identical to Claim 6, filed on 15 November 1990.

IV. In support of his request, in the Statement of Grounds of Appeal the Appellant expressed the opinion that the Examining Division had confused Articles 83 and 84 EPC. The Statement of Grounds of Appeal concluded that:

"the decision under appeal fails signally to discuss the alleged lack of clarity in the context of what purpose the claims are to fulfil. The rejection rests on, in essence, two assertions only. The first is that the last part of the claim is "vague and indefinite because it is not clear how the values are to be computed". The second is that "claim 1 would have to state the necessary detail that a person skilled in the art would be enabled to perform the invention". Neither assertion, in the submission of the Appellant, is adequate to demonstrate lack of clarity. Generally, the language employed is pertinent to a lack of sufficient description of the invention: the second statement is practically a paraphrase of Rule 27(1)(f), which requires that the "description shall ... describe in detail at least one way of carrying out the invention ...". More particularly, the assertions do not begin to demonstrate what essential feature, by any test pertinent to the claims, is missing from the claims or in what manner, pertinent to the functions of the claims, the language is unclear. The rejection is accordingly, in the submission of the Appellant, improperly made under Article 84."

Moreover, the Appellant pointed out that in the oral proceedings the Examining Division confirmed that there was no objection with regard to insufficiency according to Article 83 EPC.

The objection as to clarity made by the Examining Division was said to concern only the last paragraph of Claim 1. The Appellant made the following exhaustive analysis of that paragraph:

"4.11. The final paragraph of claim 1 has three parts, the first of which concerns the storage action of the controller (1314) and the last two of which concern the interpolating action of the controller. It is appropriate to deal with each in its turn and it will become apparent that each is a necessary technical feature expressed in clear and appropriate terms.

4.12. The first part states that [the controller] stores the set values of the selected command parameters for each of the knots. This part, which is not in dispute, concisely states the action of the controller as disclosed at page 52 line 23, page 53 line 5 and, in the specific example, at page 64 lines 34 and 35 and elsewhere.

4.13. The second part states that the controller computes values for fields between successive knots (a) in accordance with the values of the respective command parameter at the preceding and succeeding knots. This is intended to indicate concisely the action which is described in several ways, as follows:

(i) [The high level controller] "between the set times interpolates between the preceding and succeeding states for each control parameter" (c.f. page 52 line 30).

(ii) "Interpolating between the set points" (c.f. page 52 line 35).

(iii) "Between knots, each parameter is interpolated between its state at the preceding and succeeding knots [with a third degree polynomial equation, the coefficients of which] are computed in terms of the value of the parameter at the current and succeeding knots and the value of the slope or first derivative of the parameter with respect to time at the current and preceding knots". (See above page 53 lines 21 to 32.) [Emphasis added]

It may be observed that there is hardly any purpose to an interpolation unless it is "in accordance with" the values of the parameter at the selected fields. The interpolation which the present invention provides is analogous to construction of an interpolant for a set of non-colinear points in a two-dimensional field of which ordinate values are known for a few abscissa values, the ordinate values being represented in the present invention by the parameter and the abscissa by time. It is beyond doubt that a meaningful interpolation has to take into account the known values.

4.14. The final part of claim 1 refers to the computation of the values of the parameters being "(b) in accordance with the values of the slope or first derivative of the respective command parameter at the preceding and succeeding knots, so that the spatial transformations provide a smooth and continuously changing video effect".

4.15. Although there is no dispute that this final part of the claim is properly based on the description, the relevance of it to the claimed subject-matter might not be as immediately apparent as the foregoing feature. However, the significance is not difficult to derive from the nature of the desired effect and elementary mathematics, confirmed by the published work cited in the application.

4.16. The desired effect is a smooth and continuously changing effect. The starting data consists of the values of the parameter for relatively few fields in a sequence."

Following that analysis, the Appellant referred to a textbook by de Boor, cited in the description of the application, going on to show that interpolating techniques such as those referred to in Claim 1 and in the description of the application had been well established by 1981 and relied on different interpolation methods. The Appellant referred to an example given in said textbook (page 49) which was said to be directly applicable to the interpolation required for the present invention. According to this example, "the interpolant is in accordance not only with the (stored) parameter values at the relevant set points but also in accordance with the first derivative of the parameter at the relevant set points". The Appellant said that the author of the textbook started from an interpolating technique known as "piecewise linear interpolation". This technique, however, was very rough and the author, therefore, indicated that:

"both for a smoother approximation and for a more efficient proximation one has to go to piecewise polynomial approximation with higher order pieces" and, moreover, that "the most popular choice (though obviously not the only choice - Appellant's remark) continues to be a piecewise cubic approximation function."

The Appellant summed up the argument, asserting that, (having regard to Article 84 EPC) the language of Claim 1 was clear and that it correctly identified the protection sought for the invention. It, moreover, contained all necessary "essential features", first, in the sense that all the features described in the description as necessary for the performance of the invention were present in Claim 1 (i.e. they were supported by the description) and, secondly, in the sense that all essential features were present to enable the invention to be distinguished from the prior art.

Moreover, the Appellant pointed out that the decision under appeal did not treat the status of Claims 6 and 7, filed on 15 November 1990, correctly. At no time had the Appellant (Applicant) abandoned those claims.

V. The Appellant therefore requested that:

- (i) the decision of the Examining Division be set aside;
- (ii) that the application be allowed to proceed to grant with the following supporting documents:

Claims 1 to 7 as filed on 2 November 1992,
description pages 1 to 3 filed on 2 November
1992 and pages 4 to 91 as filed on 15 July 1989,
drawing sheets 1 to 10 and 12 to 19 as
originally filed, and sheet 11 as filed on
15 July 1989;

- (iii) that oral proceedings be appointed in the event that the Board of Appeal were unable to accede to request (ii) or any alternative request formulated in the Grounds of Appeal (the Appellant had in the Grounds of Appeal declared that he was prepared to change the language in the claims, were the Board to consider this necessary, e.g. to change "in accordance with" in the last paragraph of Claim 1 into "in response to" or "in dependence upon").

Reasons for the Decision

1. The appeal is admissible.
2. The ground for the refusal of the present application by the Examining Division according to the decision under appeal was that:

"the application does not meet the requirements of Article 84 EPC, because Claim 1 is not clear".

In order to be able to decide upon this issue, it is necessary to establish what the invention is, in essence, about.

3. Having regard to the fact that in the decision under appeal the Examining Division has not mentioned any prior art document, it appears appropriate to the Board to consider the technical problem, identified by the Appellant, to be the objective problem to be solved by the invention. The Appellant in its Statement of Grounds of Appeal considered that the first paragraph of Claim 1 defined the starting point of the invention and, therefore, identified the problem to be

"how to achieve a repeatable sequence of command or control parameters for an image transformation system which ... is operable to act on input arrays of data samples representing video fields to compute for each of a multiplicity of fields in a sequence, a modified array of data samples in accordance with the values **in respect of that field** of a plurality of command parameters which determine for each field a spatial

transformation of an image represented by the respected input array of data samples".

At first sight, as the Appellant has noted, it appears to be necessary to determine and store a large number of command parameters for a transformation sequence. However, according to the invention a sufficiently accurate representation of the transformation can be provided by storing values for the command parameters for only a few selected fields ("knots") and to interpolate the values for the fields between the "knots".

To the Board it appears that in Claim 1 the three paragraphs following the first introductory paragraph are perfectly clear having regard to the language used. They make clear that means must be contained in the control system which (1) select all the fields in a sequence, (2) program the said knots which are few in number relative to all the fields in a sequence; and (3) set values of selected command parameters for the said "knots". In fact, it appears that the Examining Division did not consider the paragraphs mentioned so far to be unclear.

To the Board the key-idea of the invention appears to be given in the third paragraph of Claim 1, i.e. that only "knots" (which are few relative to the number of fields) are programmed. The features according to the last paragraph of Claim 1, specify how this idea is performed in practice. The teaching of the last two lines of this claim, which only indicates the desired result to be achieved by the invention, does not represent a true technical feature. Nevertheless, it

roughly indicates the conditions and the restrictions for the computing mentioned in the first part of the paragraph.

As has been shown above, Claim 1 is clear in the sense that it uses a language that is clear and does not give rise to misinterpretation of its wording. Thus, the Board in this case finds that the requirements of the first part of the second sentence of Article 84 EPC are fulfilled, i.e. that "they (the claims) shall be clear and concise".

4. According to the decision under appeal Claim 1 lacks clarity, in particular, "because it is not clear how the values of the command parameters for fields between successive knots are to be computed in terms of the values of the respective command parameters and their derivatives at the knots". With regard to this issue, the Board, has reached the opposite conclusion:

According to Article 84 EPC, first sentence, in a European patent application "the claims shall define the matter for which protection is sought". Therefore, the primary function of a claim is to set out the scope of protection sought for an invention. This implies that it is not always necessary for a claim to identify technical features or steps in detail. Thus, the Board cannot agree with the Examining Division's decision where it is stated that "in order to be clear, Claim 1 would have to state the necessary computations in such a degree of detail that a person skilled in the art would be enabled to perform the invention without exercising inventive skill". The Board considers that it is sufficient if the application as a whole (the

claims together with the description and drawings) describes the necessary characteristics of an invention (in this case the computation) in a degree of detail such that a person skilled in the art can perform the invention. This requirement, however, relates to Article 83 EPC and is not relevant to Article 84 EPC.

The content of claims is governed by the requirements of Article 84 and Rule 29 EPC. Under Article 83 EPC sufficient disclosure is required of an application as a whole (claims together with the description and drawings), but not of a patent claim as such.

5. However, the Board also agrees with the Appellant's interpretation of the meaning of the second part of said second sentence of Article 84 EPC (as regards the requirement for the claims to be supported by the description - cf. paragraph IV above), in that all the features described in the description as being necessary to carry out the invention (essential features) must be present in a corresponding claim (cf. T 32/82, OJ EPO 8/1984, 354-356).

Thus, features which are necessary to solve the technical problem concerned must be present in the claim. During proceedings before an Examining Division, it often happens that pertinent documents are cited with the result that the core of a claimed invention has to be changed and also the corresponding problem to be solved appears in a modified form. In such cases often new essential features must be added to the claim in order to clearly identify the solution and to distinguish the invention from the prior art.

In the present case the Examining Division has not mentioned any documents in the light of which such essential features of the present Claim 1 could be identified to distinguish the invention from the prior art. However, when the prior art and the starting point of the invention is considered to be such as proposed by the Appellant, it appears (cf. paragraph 3 above) that the core of the invention is to be seen in the provision of knots from which other parameter values are somehow computed. Since no pertinent prior art has been cited against the present application, disclosing interpolation between knots as being known in what can be considered to be the technical field of the present invention, or a closely related field, *prima facie*, it appears that the subject-matter of Claim 1 at the present stage of the proceedings is clearly distinguished from the prior art mentioned by the Appellant. In the opinion of the Board no further specification of the invention in the claim c.q. distinction from the prior art is required under Article 84 EPC. For these purposes functional features may suffice in a claim.

6. It appears from the decision under appeal that the Examining Division, as suggested by the Appellant (cf. last four lines of paragraph IV, above), mistakenly considered Claims 6 and 7, filed on 15 November 1990, as having been abandoned. Thus these claims were not taken into further consideration. To the Board, it appears that independent Claim 6 is, in principle, intended to identify a method corresponding to the system according to Claim 1. The wording of Claim 6 has, however, not yet been adapted to the present Claim 1.

7. Since the Board is of the opinion that the Appellant should have the possibility to have this application examined with regard to all the requirements of the EPC by two instances, in application of the Board's discretion pursuant to Article 111(1) EPC, further examination of the present application is left to the Examining Division.

In this context, the Board notes that, according to the decision under appeal, the only ground of the refusal was lack of clarity of Claim 1.

This is also the only issue the Board has formed a judgment on in this decision and it has decided that Claim 1 as it stands, at the present stage of the proceedings, satisfies the requirements of Article 84 EPC in that Claim 1 is clear and concise. However, in arriving at this decision, the Board has based its opinion to a large extent upon the statements of the Appellant.

In order not to deprive the Appellant of an examination by two instances and considering that Boards of Appeal are primarily concerned with judging upon appeals and not with examining European patent applications, the Board has not investigated whether the application, as it stands now, satisfies Article 76(1) EPC (content in relation to parent application), Article 84 EPC, second part of second sentence (support of the claim by the description), Article 123(2) EPC (applicability to a divisional application), nor in how far the invention as claimed might fall under the exclusions of Article 52(2) EPC.

Should it be necessary to examine the inventive step of the invention, the Board would like to point out, that in the communication of 8 May 1985 by the Examining Division in charge, the subject-matter of published, amended Claim 22 of the parent application, the subject-matter of which represents the core of the present Claim 1, was considered to be obvious to a skilled person having regard to the prior art documents cited in those proceedings.

8. With regard to the Appellant's request for oral proceedings in case the Board were unable to allow the application to proceed to grant on the basis of any of the Appellant's requests, the Board notes that, under the present circumstances, where proper examination of the application in respect of all the requirements of the EPC, other than those under Article 84, has not yet even been started, it seems neither appropriate nor expedient to summon the Appellant to oral proceedings before the Board. In the case of remittal by the Board to the first instance, as at present, oral proceedings before the Board are likely to prejudice the first instance.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the application documents specified in paragraph V(ii) above.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg